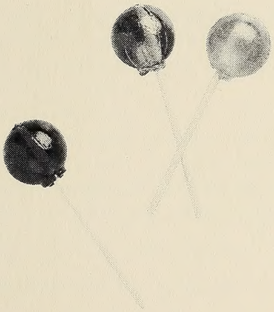
Mathematics

Module 9

Fun with Fractions

Home Instructor's Guide: Day 1–9
and
Assignment Booklet 9A



Learning Technologies Branch

Alberta
LEARNING

Grade Two Mathematics
Module 9: Fun with Fractions
Home Instructor's Guide: Days 1–9 and Assignment Booklet 9A
Learning Technologies Branch
ISBN 0-7741-2061-4

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This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

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- Alberta Learning, **http://www.learning.gov.ab.ca**
- Learning Technologies Branch, **http://www.learning.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.learning.gov.ab.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

Module 9: Fun with Fractions

Introduction

Days 1 to 10 of this module focus on fractions, specifically illustrating and explaining halves, thirds, and fourths as part of a set. Days 11 to 16 focus on communicating directions orally and in writing and creating symmetrical shapes by folding and reflecting with a mirror. The final two days are a review of Modules 1 to 6.

Whenever possible, have the student identify halves, thirds, and fourths. For example, when working with manipulatives or sets of objects of any kind, have the student tell you how many make a half, a third, and a fourth. When dividing or sharing something (a chocolate bar, a sandwich, and so on), the student can identify a half, third, and fourth of the object. Tell the student when the math class is half over, when a project is a third done, or when a fourth of a book has been read.

Encourage the student to see symmetry in objects. Have a mirror or miraboard available at all times for the student to experiment with to find symmetrical objects.

Encourage the student to work on all the Extension Activities.

Materials You Need

- manipulatives in the student's Math Box (these can be saved for future grades)
- four small plastic or paper bags or four small containers (like margarine tubs)
- miraboard (a coloured piece of plexiglass)
- mirror
- paper ($8\frac{1}{2}$ by 11)
- poster paper
- scissors
- bristol board (this item is not essential)
- construction paper (this item is not essential)
- paints (this item is not essential)
- material in the Appendix (cut out and ready in the Student Folder)

Daily Summary

If there is time remaining in a math class, have the student do the Extension Activities.

Day 1

Today is a review of Module 7.

Answers

1. a. 142 b. 190 c. 107 d. 116

2. a. 180, 181, 182, 183, 184
   b. 164, 165, 166, 167, 168
   c. 105, 106, 107, 108, 109
   d. 196, 197, 198, 199, 200

3. a. 624, 626, 628, 630, 632
   b. 458, 460, 462, 464, 466
   c. 782, 784, 786, 788, 790
   d. 336, 338, 340, 342, 344

4.

548	550	552	554	556	558	560
562	**564**	566	568	570	572	574
576	578	580	**582**	584	586	588
590	592	594	596	**598**	600	602

5. a. 470, 475, 480, 485, 490
   b. 185, 190, 195, 200, 205
   c. 710, 715, 720, 725, 730
   d. 835, 840, 845, 850, 855

6.

210	215	220	225	230	235	240
245	**250**	255	260	265	270	275
280	285	290	**295**	300	305	310
315	320	325	330	335	340	**345**

7. a. 120, 130, 140, 150, 160
   b. 580, 590, 600, 610, 620
   c. 960, 970, 980, 990, 1000
   d. 630, 640, 650, 660, 670

8.

390	400	410	420	430	440	450
460	**470**	480	490	500	510	520
530	4050	550	**560**	570	580	590
600	610	620	630	640	650	**660**

9. a. 50, 100 b. 75, 100 c. 50, 75, 100 d. 50, 75

10. a. 75¢ b. 25¢ c. 100¢ d. 50¢

11. a. 8 b. 12 c. 15 d. 20

12. a. 16 b. 21 c. 18 d. 20

13. a. 4 b. 2 c. 6 d. 4

Day 2

The student is introduced to fractions. The focus today is on halves. Have the shapes from the Appendix cut out and ready for the student to use.

Day 2: Lesson 1

Discuss sharing items equally. Listen for the student to say that the girls each got half the items. It is important that the student see the connection between getting the same amount when sharing equally.

Day 2: Lesson 2

Give the student containers of even-numbered counters (beans, bingo chips, blocks). For example, one container may have 32 beans, the other container 26 coins, another one 40 buttons, and the last one 18 blocks.

The student is to count them out, share them equally with you, and record the results on the chart. After the student completes this activity, explain how each of you got equal amounts. The student may understand the meaning of one-half.

Answers

1. 4, 2
2. 10, 5
3. 8, 4
4. 14, 7

Day 2: Lesson 3

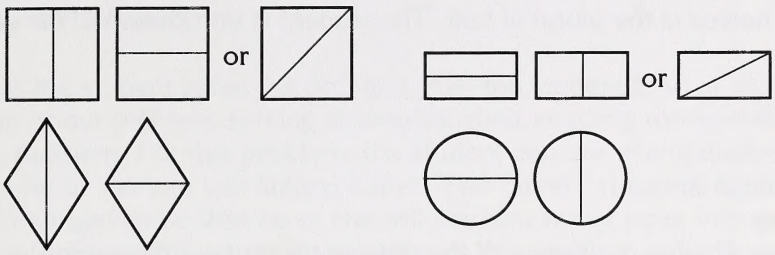
Give the student the Shapes to Fold in Half from the Appendix. Have the student fold a square in half. Explain how the student can know when it is properly folded in half: there are two parts of equal size and shape. If the student has difficulty with folding the paper in half, show him or her how to do it. Have the student continue folding each shape in half.

Explain how some shapes can be folded in half in different ways. Show the student how to fold the square in half another way, either diagonally or by folding crossways. Have the student show ways of dividing the other shapes in half by folding.

Ensure the student understands that a shape is folded in half when the two parts are of equal size and shape.

Answers

1. square, rectangle, circle, diamond

2. 

There are extension activities for Days 2 to 4.

Have the student do the assignment for Day 2 after completing the day's lessons.

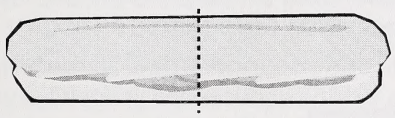
Day 3

This day reinforces the concept of half.

Day 3: Lesson 1

This lesson reinforces the concept of halves being two equal parts.

Answers

1. 

2. The two pieces are of equal size and shape.

Day 3: Lesson 2

Answers

1. The orange on the right should be red. Each piece shows one-half.

2. The apple on the right should be purple. Each piece shows one-half.

3. The cookie on the left should be blue. Each piece shows one-half.

4. The brownie on the left should be green. Each piece shows one-half.

Day 3: Lesson 3

Explain to the student that halves is the plural of half. The student is introduced to the symbol $\frac{1}{2}$.

Answers

1. a, b, c, d, h, and i should be circled.

2. Check the student's work. Ensure the halves of the objects the student draws and colours are equal.

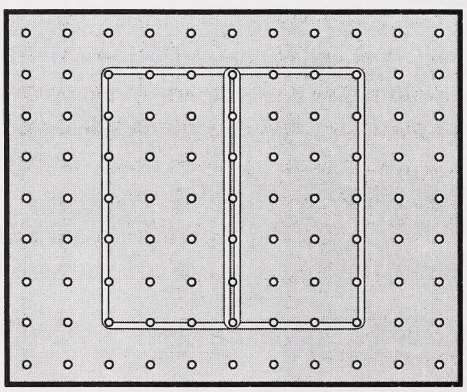
Have the student do the assignment for Day 3 after completing the day's lessons.

Day 4

The lesson today reinforces the concept of half. Remove the Dot Paper from the Appendix and put it into the Student Folder.

Day 4: Lesson 1

The student will be making shapes on a geoboard, drawing them on dot paper, and then dividing them in half on the geoboard and dot paper. Have the student make a triangle, a square, and a rectangle on the geoboard with elastic bands. With another elastic band for each, the student shows how to divide the shape in half. For example, one elastic band will make a square, and the other elastic band will make a line within the square (as shown here).



On the dot paper, the student can show how to divide the square in half several different ways with a pencil. The student may experiment making other shapes on the geoboard to see how and if they can be divided in half.

Day 4: Lesson 2

Help the student solve the problem. Ask the student if he or she understands the problem. Talk about problem-solving strategies, such as using manipulatives, drawing, or acting out the problem. For this problem, the student can use manipulatives. Suggest to the student that he or she can use linking cubes. Two cubes represent a pizza. Have the student link cubes together so that he or she will see how many pizza halves are needed to feed eight people. Ensure the student understands this problem-solving strategy. This activity helps the student understand how parts and wholes are related.

Answers

1. 2
2. 1
3. 5
4. 7

Day 4: Lesson 3

Explain the meaning of *fraction* to the student. Tell the student that it means a part of something. One-half can also mean a piece or amount of something. For example, you can have $\frac{1}{2}$ a sandwich, drink $\frac{1}{2}$ a glass of milk, or read $\frac{1}{2}$ a book or half the books you own. Ensure the student understands that a *fraction* includes all these meanings.

The student learns about *whole* and *half* and sees that they can be represented in different ways. Discuss other ways *whole* and *half* can be represented. For example, a one hundred chart coloured in is whole, coloured to 50 is half; 14 cubes linked together can be a whole, seven-linked cubes can be half; jars, cups, glasses, or spoons filled and half-filled with liquid; containers filled and half-filled with other material; ten (or any number) objects on one plate, five (or other half numbers) on another plate; and so on.

Have the student fill containers, colour in charts, put beans on a plate, link cubes or beads, and so on to get a feel for fractional sets. Have the student label each set with "whole" and "half." The student should talk about the activity as he or she is doing it. Listen for the words *whole* and *half*.

There are extension activities for Days 2 to 4.

Day 5

The student learns about thirds.

Day 5: Lesson 1

Explain how something divided into three equal parts is a third of a whole.

Day 5: Lesson 2

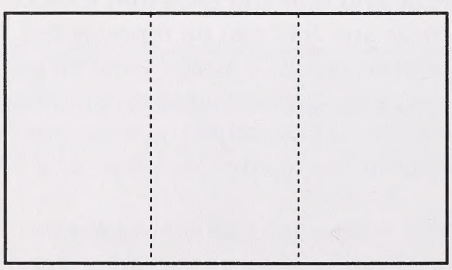
Give the student four plastic or brown bags (or containers) of counters (beans, bingo chips, blocks) divisible by three. For example, one bag may have 21 beans, the other 18 coins, another bag 30 buttons, and the last one 24 blocks. The student is to count them out, share them equally in three groups, and record the results on the chart.

Answers

1. 9, 3
2. 18, 6
3. 6, 2
4. 12, 4
5. 15, 5
6. 3, 1

Day 5: Lesson 3

Hand the student a sheet of paper. Have the student fold it in three equal parts. Here is a way of folding the paper into three. Assist the student if necessary.



Explain how the student can know it is folded in three: there are three parts of equal size.

Day 5: Lesson 4

Answers

1. Ensure $\frac{1}{3}$ of each object is coloured in.

2. These objects should be circled: a, b, c, d, e, and i.

Have the student do the assignment for Day 5 after completing the day's lesson.

Day 6

The lessons for Day 6 reinforce the concept of one-third.

Day 6: Lesson 1

Discuss thirds with the student. Explain when something is divided into thirds, the parts must be of equal size, just as halves are of equal size.

Answers

1. The orange on the left should be coloured orange. Each piece shows one-third.

2. The apple on the right should be coloured yellow. Each piece shows one-third.

3. The cookie on the left should be coloured pink. Each piece shows one-third.

4. The brownie on the right should be coloured brown. Each piece shows one-third.

Day 6: Lesson 2

Teach the fraction $\frac{1}{3}$ to the student.

Day 6: Lesson 3

Assist the student with making shapes and dividing them into thirds on the geoboard and on dot paper.

In the last activity, check the student's work. Ensure the thirds of the objects the student draws are equal.

Have the student do the assignment for Day 6 after completing the day's lessons.

Day 7

The work in Day 7 reinforces the concept of one-third.

Day 7: Lesson 1

As in Lesson 2 of Day 4, assist the student in solving the problems. Ask the student if he or she understands the problem. Review problem-solving strategies, such as using manipulatives, drawing, or acting. The student may use a diagram or manipulatives to help solve the problems.

Answers

1. 4
2. 2
3. 5
4. 1
5. 7
6. 6

Day 7: Lesson 2

Use the examples from Lesson 3 in Day 4. Have the student continue filling containers, colouring in charts, putting beans on a plate, linking cubes or beads, and so on with thirds. Have the student label the sets with "thirds." The student should talk about the activity as he or she is doing it. Listen for the words *whole*, *half*, and *third*.

Answers

1. a. a whole
   b. one-half
   c. a whole
   d. one-half
   e. a whole
   f. one-half

2. The student fills in 1 in the top row, $\frac{1}{2}$ in each square in the second row, and $\frac{1}{3}$ in each square in the bottom row.

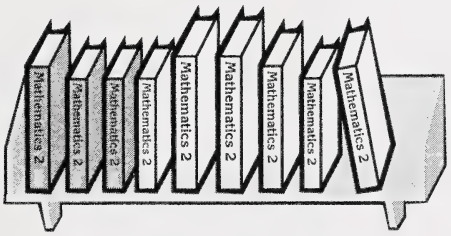
3. 

   whole

4. 

half

5. 

6. 

Day 8

In these lessons, the student learns about fourths.

Day 8: Lesson 1

Explain how something divided into four equal parts is a fourth of a whole.

Day 8: Lesson 2

Give the student four plastic or brown bags (or containers) of counters (beans, bingo chips, blocks) divisible by four. For example, one bag may have 20 beans, the other 16 coins, another bag 28 buttons, and the last one 32 blocks. The student is to count them out, share them equally in four groups, and record the results on the chart.

Answers

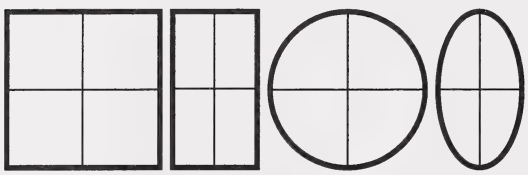
1. 4, 1
2. 12, 3
3. 24, 6
4. 20, 5
5. 8, 2
6. 16, 4

Day 8: Lesson 3

Hand the student the cut-out shapes for folding into fourths from the Appendix. Have the student fold each into four equal parts. Assist the student if necessary. Explain how the student can know they are folded in four: there are four parts of equal size.

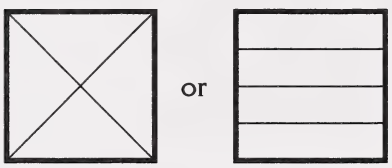
Answers

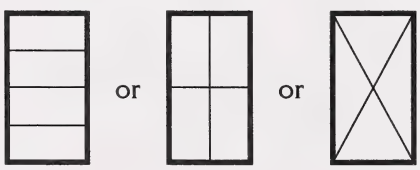
Have the student fold each of the other shapes in half. When finished, tell the student to draw a line through each of these shapes to show where it was folded in half.

1. 

2. a. square and rectangle.

   Although the circle can be folded into fourths by folding along the perimeter in a different place, the shape and size of the parts remain the same as in the original fold.

   b. 

3. 

Day 8: Lesson 4

Answers

1. Ensure one-fourth of each object is coloured.

2. These objects should be circled: a, b, c, d, e, and h.

Have the student do the assignment for Day 8 after completing the day's lessons.

Day 9

The purpose of today's lesson is to reinforce the concept of one-fourth.

Day 9: Lesson 1

Discuss fourths with the student. Explain when something is divided into fourths, the parts must be of equal size, just as halves and thirds are of equal size.

Answers

1. The orange on the right should be coloured. Each piece shows one-fourth.

2. The apple on the left should be coloured. Each piece shows one-fourth.

3. The cookie on the left should be coloured. Each piece shows one-fourth.

4. The brownie on the right should be coloured. Each piece shows one-fourth.

Day 9: Lesson 2

Teach the fraction $\frac{1}{4}$ to the student.

Day 9: Lesson 3

Assist the student as needed with making shapes and dividing them into fourths on the geoboard and on dot paper.

In the last activity, check the student's work. Ensure the fourths of the objects the student draws are the same size and are equal.

There are extension activities for Days 8 and 9.

Have the student do the assignment for Day 9 after completing the day's lessons.

When the student finishes the assignment, direct him or her to the Student Survey and Student Checklist in Assignment Booklet 9A. The student may work on these alone, or with your help. Go over the responses and discuss them with the student. Give additional instruction as needed for any of the concepts the student has indicated he or she needs help with.

Ensure that you complete the Home Instructor's Evaluation Checklist and Feedback forms for Days 1 to 9. In the Home Instructor's Feedback give any information you think may be helpful for the teacher to know.

Submit Assignment Booklet 9A for marking.

ASSIGNMENT BOOKLET 9A

Grade Two Mathematics
Module 9: Days 1–9

Home Instructor's Comments and Questions

_____
Home Instructor's Signature

FOR HOME INSTRUCTOR USE
(if label is missing or incorrect)

Student File Number:

_____

Grading Scale

A – Very Satisfactory
B – Satisfactory
C – Needs Attention
D – Unsatisfactory

Apply Module Label Here

Name
Address
Postal Code

Please verify that preprinted label is for correct course and module.

FOR SCHOOL USE ONLY

Assigned Teacher:

_____

Grading

Mathematics:

_____

Neatness:

_____

Date Assignment Booklet Received:

_____

Teacher's Comments

_____
Teacher's Signature

Home Instructor: Keep this sheet when it is returned to you as a record of the student's progress.

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When you register for distance learning courses, you are expected to send in Assignment Booklets for corrections regularly. Try to send each Assignment Booklet as soon as you have completed it. Before sending your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to be sure the spelling and details are correct?
- Is the record form filled out and the correct module label attached?

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1. Postage Regulations

Do **not** enclose letters with Assignment Booklets.

Send all letters in a separate envelope.

2. Postage Rates

Take your Assignment Booklet to the post office and have it weighed. Attach enough postage and seal the envelope. Assignment Booklets will travel faster if correct postage is used and if they are in large envelopes that are no more than two centimetres thick.

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2. All faxing costs are the responsibility of the sender.

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Module 9

Fun with Fractions

Assignment Booklet 9A

Learning Technologies Branch

Alberta LEARNING

Grade Two Mathematics
Module 9: Fun with Fractions
Assignment Booklet 9A
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Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

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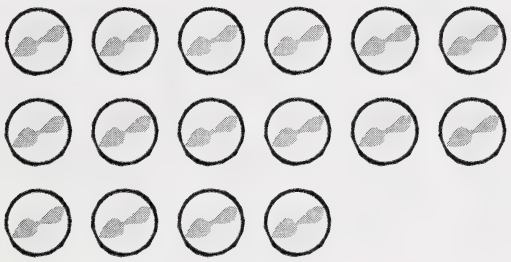
Count the total number of items in each box. Then circle the items to show two equal groups.

1. 

There are _____ marbles.

Each group has _____ marbles.

2. 

There are _____ hats.

Each group has _____ hats.

3. 

There are _____ stars.

Each group has _____ stars.

4. 

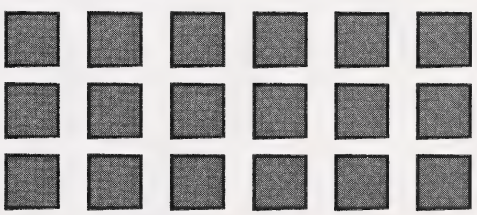
There are _____ moons.

Each group has _____ moons.

5. 

There are _____ worms.

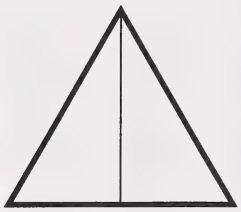
Each group has _____ worms.

6. 

There are _____ squares.

Each group has _____ squares.

1. Which pictures show halves? Circle them and colour $\frac{1}{2}$ (one-half) of each one.

a. 

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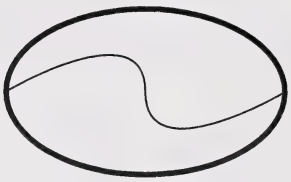
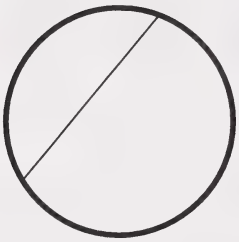
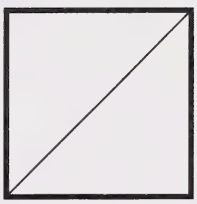
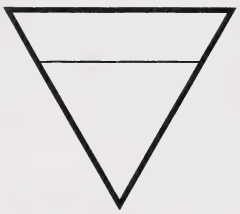
i. 

b. 

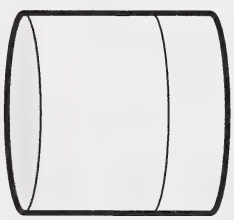
f. 

j. 

c. 

g. 

k. 

d. 

h. 

l. 

2. Explain why the shapes you circled show halves. _____

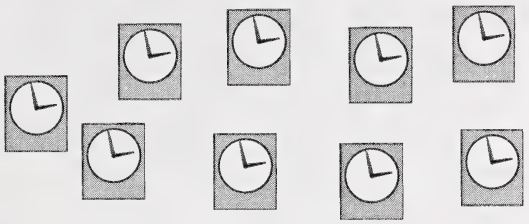
_____

_____

_____

Count the total number of items in each box. Then circle the items to show three equal groups in each box. Print the numbers on the lines.

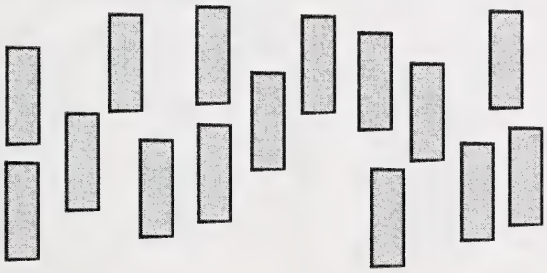
1.



There are _____ clocks.

Each group has _____ clocks.

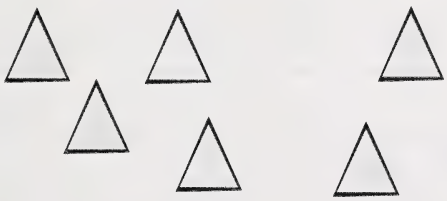
2.



There are _____ rectangles.

Each group has _____ rectangles.

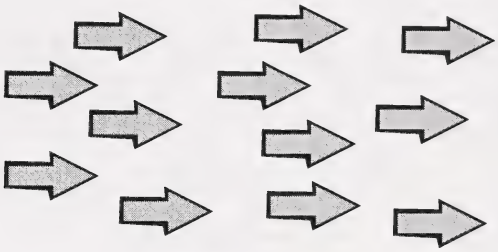
3.



There are _____ triangles.

Each group has _____ triangles.

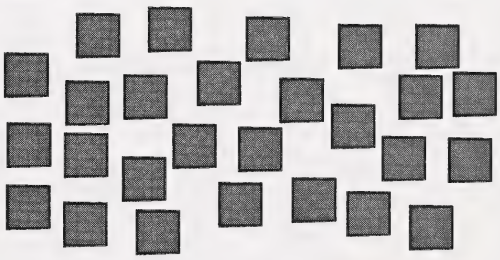
4.



There are _____ arrows.

Each group has _____ arrows.

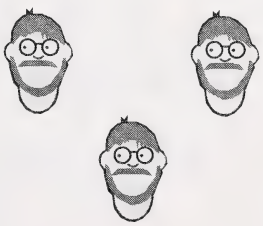
5.



There are _____ squares.

Each group has _____ squares.

6.

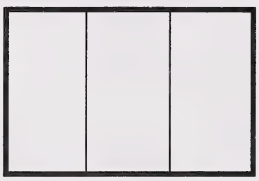


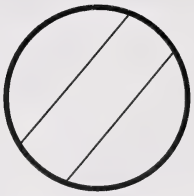
There are _____ faces.

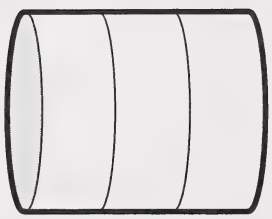
Each group has _____ faces.

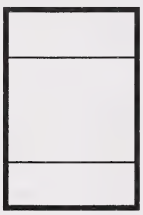
1. Which pictures show thirds? Circle them and colour $\frac{1}{3}$ (one-third) of each one.

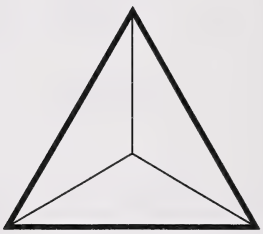
a. 

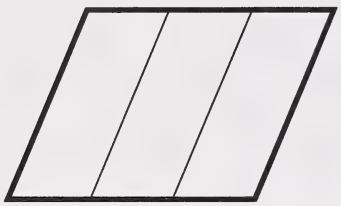
e. 

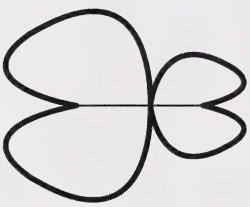
i. 

b. 

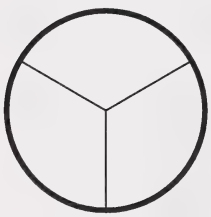
f. 

j. 

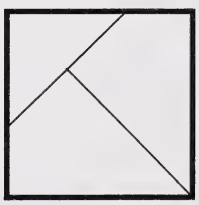
c. 

g. 

k. 

d. 

h. 

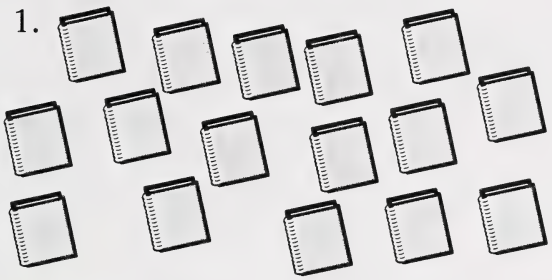
l. 

2. Explain why the shapes you circled show thirds. _____

_____

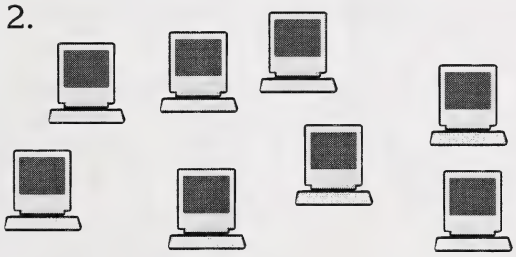
_____

Count, then draw a circle around one-fourth of the items in each box. Print the numbers on the lines.

1. 

There are _____ books.

One-fourth is _____ books.

2. 

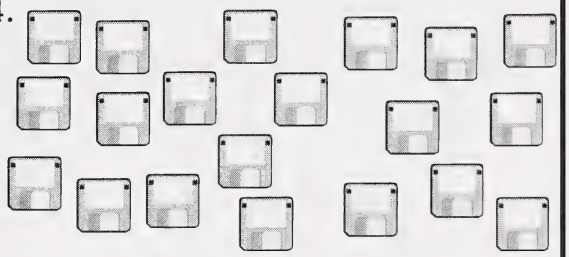
There are _____ computers.

One-fourth is _____ computers.

3. 

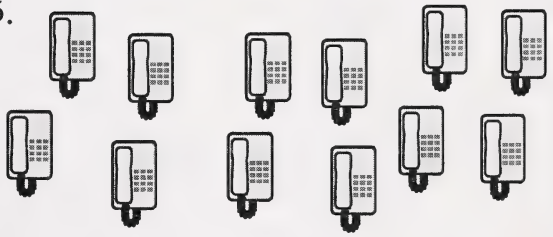
There are _____ envelopes.

One-fourth is _____ envelopes.

4. 

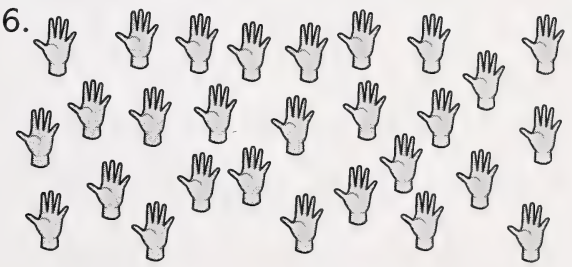
There are _____ discs.

One-fourth is _____ discs.

5. 

There are _____ telephones.

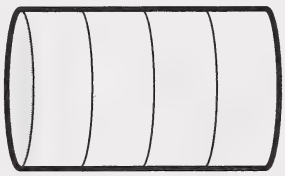
One-fourth is _____ telephones.

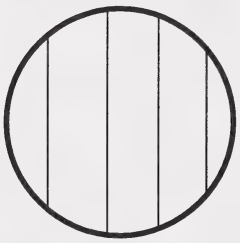
6. 

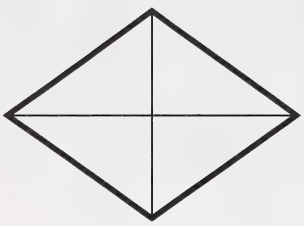
There are _____ hands.

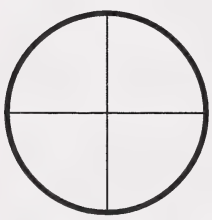
One-fourth is _____ hands.

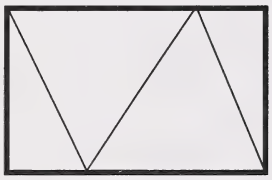
1. Which pictures show fourths? Circle them and colour $\frac{1}{4}$ (one-fourth) of each one.

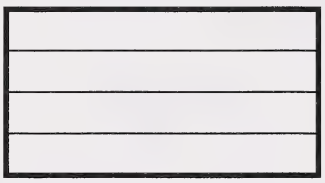
a. 

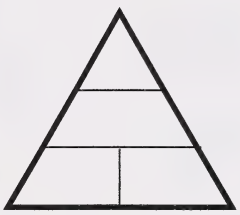
b. 

c. 

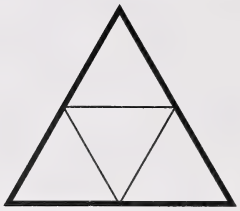
d. 

e. 

f. 

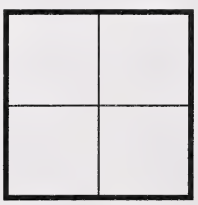
g. 

h. 

i. 

j. 

k. 

l. 

2. Explain why the shapes you circled show fourths. _____

_____

_____

Student Survey

Days 1 to 9

Think about what you have learned about fractions in Days 1 to 9. Then answer these questions.

What did you find easy about Days 1 to 9?

List three things you learned about fractions in Days 1 to 9.

Is there something you would like to know more about?

Is there something you still need help with?

Student Checklist

Days 1 to 9

I know how to . . .	Put a check mark beside the things you can do.
1. talk about fractions: halves, thirds, and fourths	
2. draw fractions: halves, thirds, and fourths	

Home Instructor's Evaluation Checklist

Days 1 to 9

Specific Outcomes/ Concepts Learned The student . . .	Has the student mastered the concept (yes or no)?
illustrates and explains halves, thirds, and fourths as part of a region or a set	

Home Instructor's Feedback